Symposium on the Mapping and Assessment of Ecosystem Services

16th February 2015 – Waterford Institute of Technology

Post Symposium Report

Summary

The sustainable management of our natural capital, facilitated by mapping and assessing the condition of our ecosystems and the provision of ecosystem services, is now a national (Actions for Biodiversity 2011-2016, Target 3) and international imperative (EU Biodiversity Strategy to 2020, Action 5; CBD Strategic Plan 2011-2020, Target 2). A Working Group on Mapping and Assessment on Ecosystems and their Services (MAES) was set up under the EU Common Implementation Framework to provide support for countries to map and assess the state of ecosystems and their services in the national territory.

Within the last 12 months, the topic of the sustainable management of Ireland's natural capital has received considerable attention with the first national conference Ireland's Hidden Wealth: A National Conference on Natural Capital held in May 2014, the EPA's Environment Ireland 2014 Conference including a workshop on Natural Capital, and the establishment of the Irish Forum on Natural Capital in early 2015 will move the agenda forward.

On the 16th February 2015, the National Biodiversity Data Centre, in collaboration with the Environmental Protection Agency and the Department of Arts, Heritage and the Gaeltacht, hosted a symposium on the 'how to' of ecosystem services mapping to engage a broad range of potential stakeholders in Ireland and begin the process of developing the necessary human and technical infrastructure to support this initiative.

The Symposium partners believe that the event succeeded in bringing together key representatives from public, private and non-governmental organisation sectors and for providing an overview of the European policy framework for ecosystem services mapping.

The key messages which emerged from the Symposium were:

1 Despite the clear cross-sectoral benefits from mapping and assessing ecosystems and their services, an entity, either a committee or and organisation, must take lead and secure resources before the role of key stakeholders can be clearly identified and recommendations for further action developed.
2 The currently internationally adopted standardised typology of ecosystem services, CICES, requires immediate appraisal of its applicability to Irish ecosystems and services. To facilitate this, the production of an interpretive document in association with a suite of case studies illustrating and effectively communicating its application should be a priority.
3 In terms of the timely and cost-effective delivery of ecosystem service mapping in Ireland, there is a clear need to develop a national spatial data framework for ecosystems and ecosystem services that will both accelerate collaboration and facilitate data interoperability across sectors.

Symposium Objectives and Outcomes

The primary objective of the symposium will be stakeholder engagement regarding the Mapping and Assessment of Ecosystem Services (MAES) process and developing a network of focal individuals across public and private sectors directly involved with the capturing and analysing data relevant to the mapping of ecosystem services in Ireland.

Expected Outcomes

1 An overview of European policy framework for Ecosystem Services Mapping.
2 Learn lessons from ecosystem service mapping initiatives in other countries i.e. what did they do right/wrong, what can we do better?
3 Identification of existing data, data sources and data needs.
4 Identification of key stakeholders, their potential roles and recommendations for further action.

Actual Outcomes

Excluding Data Centre staff and speakers, a total of 107 stakeholders attended the symposium and an additional 19 individuals responded to our online post symposium survey. In total, the event had a relatively good representation from across sectors:

Academia	43
State	33 (incl. 5 Local Authorities)
Consultants	19
NGOs	11
Other	20

1 An overview of European policy framework for Ecosystem Services Mapping.

Overall, from initial feedback from attendees, the symposium was well received and, with particular reference to the talks by the keynote speakers, successfully provided an overview of European policy and the MAES process, supported by the case-studies presented. Of the respondents to our online survey, 21% strongly agreed and 79% agreed that after attending the symposium they felt that they "received a general overview of the MAES process in Europe". The talks from the speakers will be made available for download from a dedicated webpage on the National Biodiversity Data Centre website.

2 Learn lessons from ecosystem service mapping initiatives in other countries i.e. what did they do right/wrong, what can we do better?

The immediate response of those attending is that, in terms of the implementation of the MAES process, the comparative approaches taken by other EU member states could have been illustrated more clearly and relative merits discussed in more detail. Of the respondents to our online survey, 86% agreed, 7% were unsure and 7% disagreed that after attending the symposium they felt that they "received a broad overview of how other countries approached the MAES process".

3 Identification of existing data, data sources and data needs.

With regards to the ecosystem service data maps generated from the data scoping exercise conducted prior to the symposium, 102 participants were contacted and 36 responded with indicative rankings of the ecosystem services. On the day, 73 attendees participated in the break-out room sessions with an additional 19 respondents to our follow-up online survey which facilitated additional feedback to be provided up to one month after the symposium. Overall, as a resource to be expanded on, the data maps were well received, with 80% of the respondents to our online survey feeling that they were "useful in terms of identifying potential indicators for each ecosystem service" and 86% agreed that the were also "useful in terms of identifying existing national and European data supporting the quantification of each ecosystem service".

In total, across the four focal systems summarised for the symposium, the data maps identified 284 national-level datasets and 348 indicators as potentially supporting the mapping and assessment of ecosystems services in Ireland.

System	No. of potential indicators	No. of relevant national datasets available
Agro-ecosystems	91	136
Forests	114	136
Freshwater	97	145
Marine	46	71

From the feedback provided from the breakout sessions and the online survey, additional datasets suggested as being key to building biophysical models for terrestrial and aquatic systems and services primarily related to remote sensed data and, specifically, marine data:

- MODIS (Moderate-Resolution Imaging Spectroradiometer) terrestrial and aquatic data from Terra and Aqua NASA satellites.
- Multispectral imaging data being collected by the ESA's Sentinel satellites as part of the European Earth Observation Programme.
- Dept. of Communications, Energy and Natural Resources non-commercially sensitive baseline data relating to oil and gas exploration, and Strategic Environmental Assessments of offshore renewable energy development plans.
- Marine ecological and environmental data outputs from the BioMar project.
- Upcoming data outputs from the Irish Offshore Environmental Assessment (IOSEA) 5.

With regards to the prioritisation of data acquisition to support the MAES process across the four focal ecosystems covered in the symposium, the outputs will be summarised in the 'Highlights from Breakout Sessions' section.

4   Identification of key stakeholders, their potential roles and recommendations for further action.

The immediate feedback from the Chairs and participants of the break-out rooms was somewhat mixed in terms of who the key stakeholders are and what organisations are in the position to take lead on the initiative in Ireland (note: this was prior to the formation of the Irish Forum on Natural Capital). Questions that were voiced repeatedly across breakout sessions were:

- Who is responsible for what ecosystem and/or service?
- What resources are available?
- Who is taking lead on the initiative in Ireland?

Of the respondents to our online survey, 14% strongly agreed, 43% agreed, 29% were unsure and 14% disagreed that after attending the symposium they felt that they "received a broad overview of who the key stakeholders are within Ireland in terms of implementing the MAES process". Overall, the confusion relating to which organisations were in a position to take lead on the mapping and assessment of ecosystem services precluded discussion on the definition of roles for key stakeholders and recommendations for further action.

However, one clear recommendation from across breakout groups and the online survey relates to the Common International Classification of Ecosystems Services (CICES v4.3), the currently internationally adopted standardised typology of ecosystem services. It was felt the text of the CICES classification requires much greater explanation and interpretation with respect to an Irish context. Consequently, to facilitate and accelerate engagement with the MAES process in Ireland, there is an immediate need for:

- An appraisal of the utility of the CICES classification to Irish systems via consultation with stakeholders via a series of ecosystem-specific workshops.
- The compilation of a suite of case-studies illustrating MAES for a variety of Irish systems and ecosystem services.
- The development of a 'jargon-free' reference document interpreting each service at the Class level of CICES. The crosswalk tools from the Operationalisation of Natural Capital and Ecosystem Services (OpenNESS project) could form a basis for the reference document.

Highlights from Breakout Sessions

The overarching goal of the breakout sessions were engagement and discussion on what ecosystem services would most advance the management of natural capital in each of the focal ecosystems. The specific objectives of the breakout sessions were:

1   Obtain agreement on ecosystems services that should be prioritised for action in terms of mapping and assessment. If no agreement is reached, then document the reasons for disagreement and highlight where further discussion is needed before the process can advance.
2   Identify any existing data sets for the prioritised services missing from the disseminated data maps.
3   Identify data gaps for the prioritised services i.e. data that currently does not exist but is necessary for the successful quantification of the ecosystem service.
4   Prioritise the data gaps for action.

In most cases, objectives 1 was achieved as a general consensus was reached regarding an indicative 'Top 5' services for prioritised action within each of the provisioning, regulation and maintenance, and cultural ecosystem services across the four focal ecosystems. Where a clear consensus could not be reached, more than five services were identified as priority. However, across all breakout sessions, participants felt the language of the CICES classification, and the lack of clear Irish-specific examples of mapping and assessment exercises, hindered their ability to contribute fully to the discussion. In general, progress on the objectives 2 and 3 was mixed across rooms, and insufficient time was available for an informed discussion on objective 4.

Agro-ecosystem Breakout Session

Chair: Stuart Green

Rapporteur: Tomás Murray
Attendance: 31
Online respondents: 8

General Notes:

- Most participants agreed they had a preconceived ranking process in mind and found it difficult to reconcile what they believe to be the 'correct' way versus an opposing ranking methodology. Therefore, it was decided not to have a strict ranking but an indicative 'Top 5' instead.
- The currently adopted rationale for ranking based on the connectedness and linkage of ecosystems services stimulated a lot of positive discussion and participants felt it got them thinking about ecosystems services in a different way.
- There was still an issue of what appropriate spatial scale could or should an ecosystem service be mapped.
- In many cases where ecosystem services are managed with public finances, regulating and cultural services should be prioritised over provisioning services.
- It was felt that water, whether surface, ground, drinking or non-drinking was a single ecosystem division (i.e. should be combined) for mapping. Whether it's for drinking or non-drinking will fluctuate with time.
- More granulation could be added to particular services e.g. the division between provisioning and cultural for forests is linked to access.

Suggested priority provisioning services in agro-ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Surface water for drinking	Merge
Ground water for drinking	
Cultivated Crops	
Plant-based resources	
Reared animals and their outputs	
Surface water for non-drinking purposes	Merge
Ground water for non-drinking purposes	

Suggested priority regulation and maintenance services in agro-ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Global climate regulation by reduction of greenhouse gas concentrations	
Pollination and seed dispersal	
Filtration/sequestration/storage/accumulation by ecosystems	
Hydrological cycle and water flow maintenance	
Flood protection	
Chemical condition of freshwaters	
Storm protection	
Decomposition and fixing processes	

Suggested priority cultural services in agro-ecosystems

Class level CICES ecosystem service	Suggested change to CICES

Heritage, cultural	
Physical use of land-/seascapes in different environmental settings	
Aesthetic	
Scientific	
Symbolic	

Forest Breakout Session

Chair: Declan Little
Rapporteur: Úna Fitzpatrick
Attendance: 12
Online respondents: 5

General Notes:

- There was confusion as to whether the term forest should refer to coniferous or broad leaved forest. For the purposes of discussions, it was assumed it referred to the overall national forest resource.
- It was initially felt that the following two regulation and maintenance services referred to the same thing and should be combined: Global climate regulation by reduction of greenhouse gas concentrations; Filtration/sequestration/storage/accumulation by ecosystems.
- It was noted that, with regards to provisioning ecosystem services, members of the group from southern/central Europe ranked wild plants and their outputs higher than Irish members, who felt that wild animals (e.g. deer) and their outputs were of greater value.

Suggested priority provisioning services in forest ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Fibres and other materials from plants, algae and animals for direct use or processing	
Surface water for drinking	
Wild plants, algae and their output	
Wild animals and their output	
Plant-based resources	

Suggested priority regulation and maintenance services in forest ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Global climate regulation by reduction of greenhouse gas concentrations	Merge
Filtration/sequestration/storage/accumulation by ecosystems	
Hydrological cycle and water flow maintenance	
Maintaining nursery populations and habitats	
Mass stabilisation and control of erosion rates	
Micro and regional climate regulation	

Suggested priority cultural services in forest ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Experimental use of plants, animals and landscapes in different environmental settings, and physical use of landscapes in different environmental settings	
Existence and bequest	
Symbolic and sacred and/or religious	
Scientific, educational, heritage, cultural, entertainment and aesthetic	

Freshwater Breakout Session

Chair: Mary Kelly-Quinn
Rapporteur: Lynda Weekes
Attendance: 14
Online respondents: 2

General Notes:

- Over-riding factor in determining ranking for provisioning and regulation/maintenance services was water quality, as this affects many other services.
- A lot of time was spent in trying to interpret the meaning of many ecosystem service categories and decipher subtle differences between them. It was therefore suggested that some separate ecosystem services should be categorised as one e.g. 'storm protection' and 'flood protection'.
- Dilution by atmosphere, freshwater and marine ecosystems was originally ranked lowly but was changed in the course of the discussion as was felt that this was an important ecosystem service provided by aquatic systems, albeit in the context of dilution of pollutants from anthropogenic activities.
- Most participants felt that many of the CICES class-level categories should be merged in to one, as highlighted in the freshwater session tables.

Suggested priority provisioning services in freshwater ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Surface water for drinking	
Ground water for drinking	
Wild animals and their output	
Surface water for non-drinking purposes	
Ground water for non-drinking	
Wild plants, algae and their output	
Surface water for drinking	

Suggested priority regulation and maintenance services in freshwater ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Chemical condition of freshwaters	
Filtration/sequestration/storage/accumulation by ecosystems	Merge

Filtration/sequestration/storage/accumulation by microorganisms, algae, plants, and animals	
Dilution by atmosphere, freshwater and marine ecosystems	
Hydrological cycle and water flow maintenance	Merge
Storm protection	
Flood protection	
Buffering and attenuation of mass flows	
Global climate regulation by reduction of greenhouse gas concentrations	
Bio-remediation by microorganisms, algae, plants, and animals	Merge
Weathering processes	
Pollination and seed dispersal	
Maintaining nursery populations and habitats	Merge
Pest control	
Decomposition and fixing processes	

Suggested priority cultural services in freshwater ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Physical use of land-/seascapes in different environmental settings	
Existence	
Heritage, cultural	
Scientific	Merge
Educational	
Experiential use of plants, animals and land-/seascapes in different environmental settings	
Aesthetic	

Marine Breakout Session

Chair: Stephen Hynes
Rapporteur: Ben Malone
Attendance: 16
Online respondents: 4

General Notes:

- The point was made that the Marine Institute is underrepresented as a potential source of information, even for the likes of mechanical energy services. Met Éireann would also possibly have data in relation to such services.
- It was felt that water transport services could be included as a provisioning service.
- It was unclear to participants what organisation represents marine tourism in Ireland.
- With increasing weather disturbances it was believed that 'storm protection' and 'flood protection' should certainly be a priority regulation and maintenance ecosystem service.
- Measuring biodiversity in sea beds could be used as a proxy for carbon sequestration rates in the sea beds themselves as biodiversity affects the rate immensely i.e. high energy turnover worms vs. more sessile organisms.

- Due to the fact that "Micro and regional climate regulation" and "Global climate regulation by reduction of greenhouse gas concentrations" were seen to be the same by some, "Micro and regional climate regulation" was taken out of the top ranked services.
- In terms of data gaps, the quantification of seaweed abundance and diversity was seen as an achievable short-term goal to support the mapping and assessment of coastal ecosystems and services.
- It was noted that potentially many other data gaps may be identified as part of the consultation process on the Offshore Renewable Energy Development Plan.

Suggested priority regulation and maintenance services in marine ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Wild animals and their outputs	
Wild plants, algae and their outputs	
Genetic materials from all biota	
Animals from in-situ aquaculture	
Animal-/Plant-based resources	

Suggested priority regulation and maintenance services in marine ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Maintaining nursery populations and habitats	
Global climate regulation by reduction of greenhouse gas concentrations	
Filtration/sequestration/storage/accumulation by microorganisms, algae, plants, and animals	Merge
Filtration/sequestration/storage/accumulation by ecosystems	
Hydrological cycle and water flow maintenance	
Bio-remediation by microorganisms, algae, plants, and animals	
Mass stabilisation and control of erosion rates	
Micro and regional climate regulation	Merge
Global climate regulation by reduction of greenhouse gas concentrations	
Storm protection	
Flood protection	

Suggested priority regulation and maintenance services in marine ecosystems

Class level CICES ecosystem service	Suggested change to CICES
Bequest	
Aesthetic	
Educational	
Physical use of land-/seascapes in different environmental settings	
Scientific	Merge
Experimental use of plants, animals and land-/seascapes in different environmental settings	
Heritage, cultural	